



STOPPING THE HORNET INVASION

The world's largest wasps made their way from Asia to the U.S. Can scientists stop them?

One morning in early December 2019, Jeff Kornelis of Blaine, Washington, stepped outside to walk his dog. He noticed a wasp nearly the length of his pinky finger lying dead on his front porch. The

wasp had an orange head, gigantic wings, and a tiger-striped abdomen. He'd never seen an insect like it.

Kornelis contacted state officials about the strange sighting. Scientists from the Washington State Department of Agriculture (WSDA)

drove three hours from their office in Olympia to examine the huge bug. What they saw confirmed their worst suspicions: It was an Asian giant hornet, the largest type of wasp in the world.

Asian giant hornets aren't supposed to be in northern

Washington. They're native to Japan and other parts of eastern Asia. They'd never been found in the U.S. before. The wasps, which prey on bees, could wreak havoc on local hives. The scientists quickly hatched a plan to hunt down where the hornets were nesting—and hopefully eradicate them before they could spread.

KILLER WASPS

Asian giant hornets grow up to 2 inches long—four times as long as a yellow jacket. Nobody knows how they reached

North America. They likely nested in international cargo, says Todd Murray, an entomologist at Washington State University.

When attacked, giant hornets use their extra-long stingers to defend themselves. People have compared the pain of a sting to having hot nails driven into their skin. Repeated stings have occasionally caused fatal allergic reactions in people, earning the insects the nickname “murder hornets.” But human deaths are extremely rare, and the real threat isn't to people—it's to honeybees.

In the fall, Asian giant hornets seek out beehives. They kill bees and chew their bodies into “meatballs” to feed their young. Groups of hornets sometimes swarm a hive and kill every bee inside it. About 20 hornets can slaughter tens of thousands of bees within hours, says Murray. That's a problem because approximately one-third of the food Americans eat comes from plants that honeybees pollinate. Food supplies could suffer if the Asian giant hornet spreads out of control.

ON THE HUNT

The WSDA scientists asked people to report giant hornet sightings. They plotted the sightings



on a map, then drew circles around them based on how far the insects usually fly. That told them where to place traps to try to catch more hornets. Local beekeepers helped them set more than 2,500 traps that attract and kill the wasps.

Last September, WSDA scientist Chris Looney captured the first live hornet in a net. If his team could follow it, it would lead them right to its nest. The scientists tried gluing a tracking tag to the hornet, but that prevented it from flying. The next week, they used dental floss to tie a tag on another hornet, but it flew away so fast that they lost the signal from the tag.

In October, the team tried longer-range tracking tags. One hornet they



Asian giant hornets use their large mandibles, or mouthparts, to kill bees.



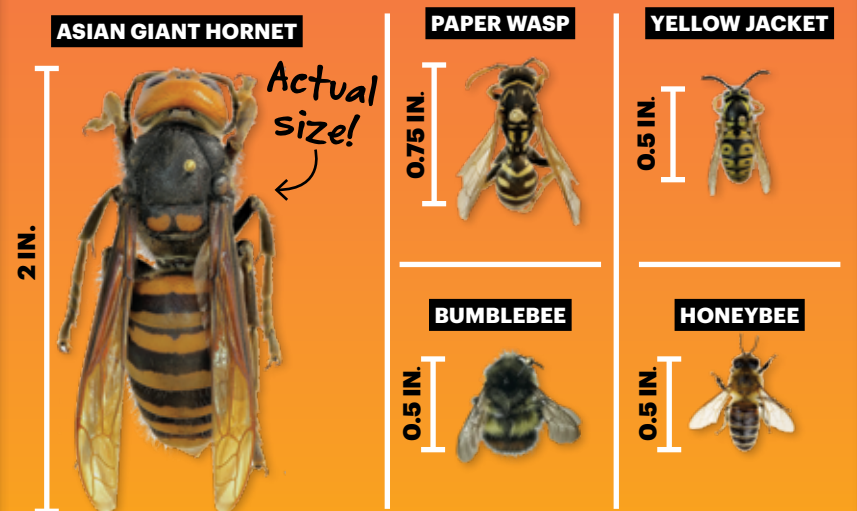
tagged nearly got away. But then the scientists picked up a faint signal that led them to a large tree. They saw a hornet fly into a crevice in the trunk. They'd found the nest! “We were pumped,” says Looney.

THE FINAL SHOWDOWN

Two days later, the team returned before dawn. They zipped themselves into thick suits to protect

HUMONGOUS HORNETS

The Asian giant hornet is the largest wasp in the world. Here's the actual size of some other species of wasps and their close relatives, bees.



1 TRACKING

A hornet with a tracking tag led scientists to the nest.

2 WRAPPING

The scientists sealed the nest with plastic wrap and foam.

3 VACUUMING

They suctioned the adult hornets out.

against stings. They sealed the crevice around the nest with foam and plastic to keep hornets from escaping. Then they cut a hole wide enough to fit a vacuum hose and banged on the tree to rile up the insects. “As the wasps would come out, I would vacuum them,” says Looney.

It took about 45 minutes to remove most of the hornets. Afterward, the team determined that more than 500 hornets were inside, including 184 potential queens. Some of those queens could have started new colonies. “We caught it right in the nick of time,” says Looney.

Despite successfully eradicating this nest, the

WSDA suspects there may be more out there. Looney and his team are staying vigilant just in case. Luckily, no Asian giant hornets have been spotted outside of northern Washington so far. That means there’s still a chance to stop them—before they spread through the U.S.

—Mara Grunbaum

WORKING WITH A MAP’S SCALE

To narrow down the location of an Asian giant hornet nest, scientists place traps in circular zones based on where live hornets have been spotted and how far the bugs can fly. A map’s scale tells you the ratio between the distance on the map and the real-world distance. You can use it to find the actual distances between places on a map.

EXAMPLE: Asian giant hornets are most likely to attack beehives that are within 1 kilometer of their nest. How many units on the map is 1 km?

Step 1 Look at the map key and identify the map’s scale:

1 unit = 2 Kilometers

Step 2 Rewrite the scale as a proportion to find how many units represent 1 km.

$$\frac{1 \text{ unit}}{2 \text{ km}} = \frac{x \text{ unit}}{1 \text{ km}}$$

Step 3 Cross-multiply and solve the equation to find the value of the unknown variable.

$$1 \text{ unit} \times 1 \text{ km} = x \text{ unit} \times 2 \text{ km} \\ \div 2 \text{ km} \quad \div 2 \text{ km}$$

$$\frac{1}{2} \text{ unit} = x \text{ unit}$$

→ So, on this map, 1 km is equal to $\frac{1}{2}$ unit.

YOUR TURN

The map below shows the region around Bellingham, Washington, where an Asian giant hornet was spotted in July 2020. The coordinate plane is aligned so that the hornet sighting is at the origin (0, 0). Answer the questions to learn more about how scientists place traps and hunt a nest.

1 A. Asian giant hornets typically forage for food within 2 kilometers of their nest. What are the coordinates of the point farthest north they would travel from the sighting? Mark this as point A on the map.

1B. What are the coordinates of the distance farthest east they would travel? Mark this as point B.

1C. What are the coordinates of the distance farthest south they would travel? Mark this as point C.

1D. What are the coordinates of the distance farthest west they would travel? Mark this as point D.

1E. Draw a rough circle around these 4 points that you have marked on the map.

2 A. The farthest that Asian giant hornets are known to fly is 8 km from their nest. How many units is that?



2B. Determine the following coordinates within the 8-km radius hornets can fly, mark the points on the map, and draw a rough circle around them:

NORTH:
Point E

EAST:
Point F

SOUTH:
Point G

WEST:
Point H

2-km radius where hornets would forage, mark the points on the map, and draw a rough circle around them:

NORTH:
Point J

EAST:
Point K

SOUTH:
Point L

WEST:
Point M

3B. If you were a scientist trying to locate the hornet nest using these data points, where would you focus your search? Explain on a separate sheet of paper.

3 A. If another Asian giant hornet is spotted at (2, -3), determine the coordinates within a